Several econometric studies seek to explain the determinants of knowledge production using as dependent variable the number of patents in a region. Some of these capture the effects of knowledge spillovers through linear models with spatial autorregressive term. However, no study has been found that estimates such effect while also considering the discrete nature of the dependent variable: a count variable.

This essay aims to fill this gap by proposing a new Two-step Maximum Likelihood estimator for a Spatial Autorregressive Poisson model. The properties of this estimator are evaluated in a set of Monte Carlo Experiments. The simulation results suggest that this estimator presents lower Bias and lower RMSE than the alternative estimators proposed, only showing worse results when the spatial dependence is close to the unit. An empirical example, using the new estimator and a set of alternative estimators, is executed, where the creation of knowledge in 234 NUTS II from 24 European countries is analyzed. The results show that there is a strong spatial dependence on the creation of innovation. It is also concluded that the socio-economic environment is essential for the knowledge formation and, unlike public R&D institutions, private companies are efficient in producing innovation. It should be noted that regions with less capacity to transform R&D expenses into new patents, have greater capacity for absorption and segregation of knowledge, which shows that neighboring regions less efficient in the production of knowledge tend to create strong relations with each other taking advantage of the knowledge sharing process.